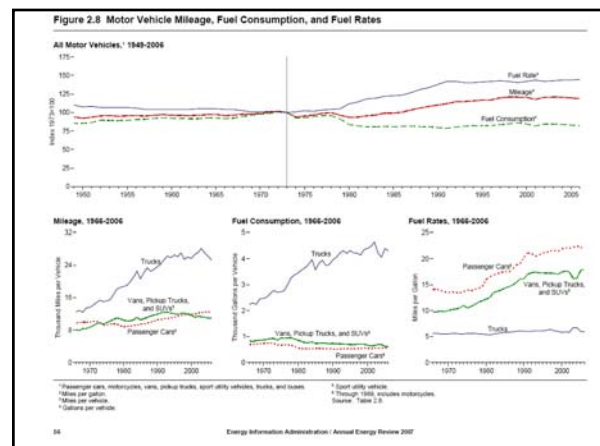
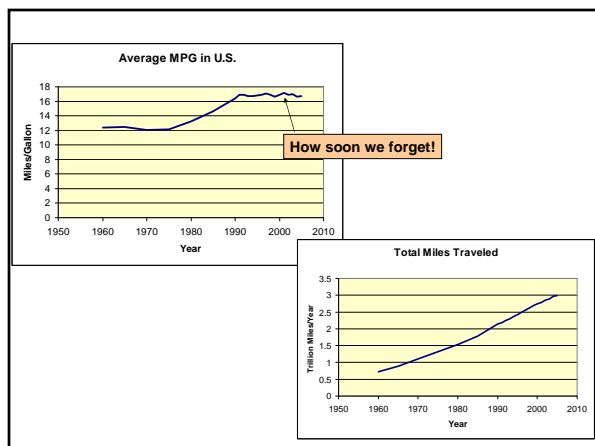
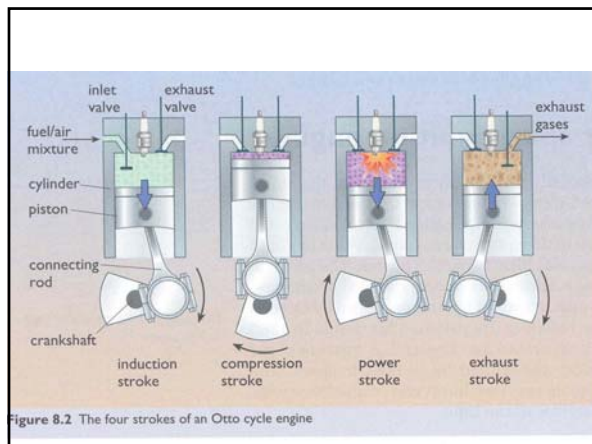


- ### Tips for Increasing Mileage
1. Don't buy an SUV!
  2. Keep your car maintained
    - Air pressure in tires
    - Air filters
    - Tune-ups (spark plugs, O<sub>2</sub> sensor)
  3. Combine short trips
    - Warm car is more efficient than cold car
  4. Drive more efficiently
    - Don't zoom-stop
    - Slow down
    - Avoid idling (if >30 s, turn off car)

### Quiz

- You are trying to decide between two cars:
  - Toyota Corolla, 30 mpg, \$16,770
  - Toyota Prius, 42 mpg, \$22,700
- Gas costs \$3.75/gal
- How many miles must you drive before it is cheaper to drive the Prius?





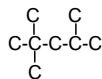
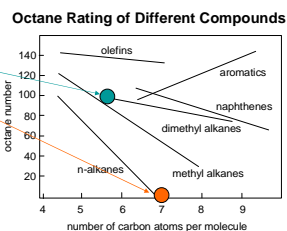
## Gasoline Engine vs Diesel Engine

- A gasoline engine intakes a mixture of gas and air, compresses it and ignites the mixture with a spark. A diesel engine takes in just air, compresses it and then injects fuel into the compressed air. The heat of the compressed air lights the fuel spontaneously.
- A gasoline engine compresses at a ratio of 8:1 to 12:1, while a diesel engine compresses at a ratio of 14:1 to as high as 25:1. The higher compression ratio of the diesel engine leads to better efficiency.
- Gasoline engines generally use either carburetion, in which the air and fuel is mixed long before the air enters the cylinder, or port fuel injection, in which the fuel is injected just prior to the intake stroke (outside the cylinder). Diesel engines use direct fuel injection -- the diesel fuel is injected directly into the cylinder.

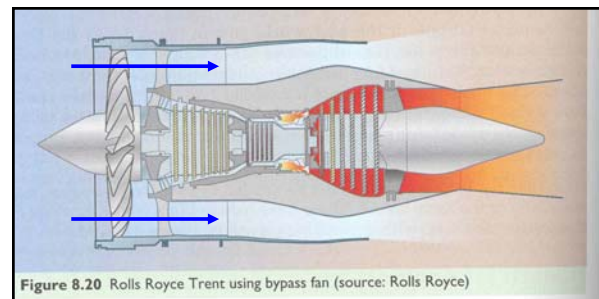
From (<http://auto.howstuffworks.com/diesel1.htm> )

## Octane Rating

- Rates "knock" characteristics
  - Iso-octane = 100
  - N-heptane = 0
  - Lots of other compounds
- Tested on a specific calibrated engine at each facility
- Similar test for diesel fuel to get cetane number
- **Has nothing to do with energy content!**



2,2,4 trimethyl pentane  
(this is what they call iso-octane)



80% of the thrust comes from the fan that blows air through the bypass section!